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(54) [Title of Invention]   Electronic document search system

(57) [Abstract]   (Revised)

[Purpose]   To easily search for original electronic documents.

[Constitution]   Appended information on an output document is read and a search is conducted on all systems connected to the network for the original electronic document of the output document. After the original electronic document has been found, if the appended information contains access authorization information, access to the electronic document is granted when the electronic document is found based on the access authorization information. In addition, if the appended information contains information about the application used to create the electronic document, the same application as the application used to create the electronic document is started based on the application information.

[FIGURE]

Example of Output Document with Appended Information

Report on Penguins

← Print Area

↑
Appended Information Code

1

[Claims]

[Claim 1] An electronic document search system that searches for electronic documents produced on a computer, wherein the electronic document search system is characterized by being equipped with an information appending means that appends information pertaining to the electronic document to an output document in which the electronic document is output on paper, an appended information reading means that reads the aforementioned information pertaining to the electronic document that has been appended to the output document by means of said information appending means, and a search processing means that performs search processing for said electronic document based on the aforementioned information pertaining to the electronic document that has been appended to the output document by means of said information appending means.

[Claim 2] The electronic document search system described in claim 1, characterized by the aforementioned information appending means appending the aforementioned information pertaining to the electronic document to the output document in a form that is easily read by the aforementioned appended information reading means.

[Claim 3] The electronic document search system described in claim 1 or claim 2, characterized by the aforementioned information pertaining to the electronic document containing address information that indicates the location of said electronic document on the computer.

[Claim 4] The electronic document search system described in claim 1 or claim 2, characterized by the aforementioned information pertaining to the electronic document containing access authorization information that controls access to said electronic document.

[Claim 5] The electronic document search system described in claim 1 or claim 2, characterized by the aforementioned information pertaining to the electronic document containing application information to automatically start the application to perform editing of said electronic document.

[Claim 6] The electronic document search system described in claim 1 or claim 2, characterized

by the aforementioned information pertaining to the electronic document containing information that shows a summary of the contents of said electronic document.

[Claim 7] The electronic document search system described in any of claim 1 through claim 6, characterized by the aforementioned computer being connected to a network and by the aforementioned search processing means being able to search electronic information produced on other computers that are connected to said network.

[Detailed Description of the Invention]

[0001]

[Field of Industrial Application] This invention pertains to search system for electronic documents created on a computer.

[0002]

[Prior Art] With the popularization of computers in recent years, the creation of general documents on computers (electronic documents) has increased, and the resulting electronic documents are stored on storage devices as electronic data, or are output on paper and said output documents are reviewed, distributed, or stored.

[0003]

[Problems Solved by the Invention] However, in the event that a recipient of the distributed output document requests the original electronic document, the creator or editor of the electronic document must find said electronic document and then send the original electronic document to the requestor's computer via the network, etc. In other words, a problem with the existing means was that it was always necessary to go through the creator, etc. of said electronic document if a distribution recipient was to obtain the original electronic document, hindering the easy utilization of electronic documents.

[0004] Difficulty of operation was also a problem because, when an original electronic document was required, the creator had to search for it on the computer, and further to check the contents of found electronic documents, on the basis of their own memory, etc.

[0005] Furthermore, since electronic documents could be easily copied and/or edited in past electronic

2

document systems, there were problems in protecting the data because the creator of the electronic document could not control permission for copying, editing, and displaying the contents of an electronic document (hereinafter, access authorization) with respect to distribution recipients.

[0006] Difficulty of operation was also a problem in that, to find an electronic document and then edit the found electronic document, it was necessary to start the application appropriate to said electronic document afresh after completing the search.

[0007] When the created electronic document extended over multiple pages, further problems arose in the large amount of paper that was distributed and in the amount of time consumed by searching, i.e., checking contents, etc.

[0008] This invention was created to solve the aforementioned past problems, and its purpose is to provide an electronic document search system whereby a person that needs an original electronic document can easily utilize said electronic document.

[0009]

[Means of Solving Problems] In order to achieve the aforementioned purpose, this invention is an electronic document search system that searches for electronic documents produced on a computer, which is characterized by being equipped with an information appending means that appends information pertaining to the electronic document to an output document in which the electronic document is output on paper, an appended information reading means that reads the aforementioned information pertaining to the electronic document that has been appended to the output document by means of said information appending means, and a search processing means that performs search processing for said electronic document based on the aforementioned information pertaining to the electronic document that has been appended to the output document by means of said information appending means.

[0010]

[Action] With the aforementioned constitution, information pertaining to the electronic document can be appended to the output document by the information appending means, the information

appended to the output document can be read by the appended information reading means, and a search processing for said electronic document can be performed based on the read information.

[0011]

[Example Embodiment] And example embodiment of this invention will be described below, referring to Figures 1 through 4.

[0012] Figure 1 is a block diagram showing the constitution of the electronic document search system associated with this example embodiment. In this figure, an electronic document search system (hereinafter, referred to simple as the system) 101 comprises a display part 1 that displays the contents of the electronic document and displays warnings to the user, etc., a storage part 2 on which the created electronic document is stored, a reading part 3 that reads the appended information from the output document, an output part 4 that prints out the electronic document on recording paper together with the appended information by a means described below, and a computer that controls the aforementioned display part 1, storage part 2, reading part 3, and output part 4 and creates, edits, and searches for electronic documents.

[0013] System 200 consists of a display part 6, storage part 7, reading part 8, output part 9, and computer 10 that have the same functions as the display part 1, storage part 2, reading part 3, output part 4, and computer 5 of said system 100, and computer 5 and computer 10 are connected by means of a network 11 for connecting multiple computers.

[0014] In this example embodiment, a situation will be described below in which an electronic document is created and output on system 100 and said electronic document is searched for on system 200.

[0015] An electronic document is created by an application that is already installed on the computer 5 in system 100. In addition, the user can create the electronic document while checking it on the display screen of the display part 1. The created electronic document is transmitted from the memory (not shown) in the computer 5 to the storage part 2 and stored there.

[0016] When an electronic document that has been stored on said storage part 2 is to be output to

recording paper, etc., appended information for the electronic document is first created by the computer 5. The created appended information is appended to the output document by the output part 4 and output.

[0017] Meanwhile, when an electronic document stored on the storage part 2 of system 100 is searched for on system 200, first, the appended information that has been appended to the output document is read by the reading part 8, and then a search is conducted for the electronic document by the computer 10 on the network 11 on the basis of said appended information. When the desired electronic document is found, the computer 10 loads the electronic document that has been found from the storage part 2 to the memory (not shown) of the computer 10 via the network 11 and displays the contents of the document on the display part 6

[0018] The electronic document output processing and search processing that are performed by an electronic document search system that operates in this way will be explained in detail below.

[0019] Figure 2 is a flow chart to explain the processing and operation to create and record the appended information on an electronic document that are executed after said electronic document has been created on a computer 5.

[0020] First, the user creates the electronic document for the first time on the computer 5 (step S21), stores said electronic document on the storage part 2 (step S22), and then chooses whether or not to write appended information when the electronic document is output by the output part 4 (step S23).

[0021] If the answer at step S23 is YES, i.e., when appended information is to be written, the user first chooses whether or not to write information on the application used on the computer 5 as the appended information (step S24). When writing the application information is chosen here, the computer 10 creates application information for use in the appended information (step S25). If this information is not to be written, processing skips step S25 and proceeds to subsequent step S26.

[0022] Next, the user chooses whether or not to write access authorization information, e.g., information to protect the electronic document by restricting permission by the creator of the electronic

document to copy, edit, or display the contents of the electronic document, etc., when the electronic document is found based on the appended information, as appended information (step S26). If writing is chosen, the computer 10 creates access authorization information for use in the appended information (step S27). If it not writing is chosen, step S27 is skipped, and processing proceeds to subsequent step S28.

[0023] In step S28, the computer 5 creates information indicating the storage location of the electronic document being output (address information) and information regarding the author of the electronic document and the date is was created, etc., that might be necessary to search for the electronic document.

[0024] Then, the application information, access authorization information, and address information respectively created in aforementioned steps S25, S27, and S28 is written by the output part 4 to the electronic document (step S29) and output (step S30). If it is chosen in aforementioned step S23 not to write appended information to the electronic document, processing proceeds to step S30 without performing steps S24 through S29 and the electronic document is output. An example is shown in Figure 3 of an output document in which appended information has been appended in aforementioned steps S29 and S30. In this figure, the appended information is output in the form of a bar code.

[0025] Figure 4 is a flow chart showing the procedure for searching from system 200 for an original electronic document that is stored on the storage part 2 of system 100, as described above, and then displaying it on the display part 6. Now, all of this processing is executed under the control of computer 10.

[0026] First, the appended information recorded on the output document is read by the reading part 8 (step S41), and the appended information that has been read is analyzed by the computer 10 (step S42). Next, it is determined, based on the results of the analysis in step S42, whether the appended information has been recorded in the proper format (step S43), and if the format is deemed proper, processing proceeds to step 44, while if it is deemed

4

improper, processing advances to step S52, described below.

[0027] Next, at step S44, based on the appended information analyzed in step S42, the original electronic document of said output document is searched for on all systems connected to the network 11. Then, it is determined at step S45 whether the original electronic document has been found and if the answer is YES, processing proceeds to step S46, while if it is NO, processing advances to step S52.

[0028] At step S46, it is determined whether information authorizing access when the electronic document is found is contained in the appended information analyzed in step S42, and if it is, access to the electronic document is grated based on said access authorization information (step S47) and processing proceeds to step S48.

[0029] At step S48, it is determined whether information on the application with which the electronic document was created is contained in the appended information analyzed in step S42, and if it is, the same application as the application used to create the electronic document is opened in step S49 on the basis of said application information, and processing proceeds to step S50.

[0030] In step S50, the original electronic document is loaded from the storage part 2 in the system 100 on which it was found into the memory of computer 10, and in step S51, the electronic document that has been read is displayed on the display part 6.

[0031] Meanwhile, if the answer is NO in steps S43 and in step S45, a warning is displayed on the display part 6 in step S52 to the effect that the format of the appended information is improper, or that the original document cannot be found.

[0032] Now, since system 100 and system 200 have identical functions, processing would be identical even if a search were performed in some arrangement other than that described above (e.g., if the electronic document were created on system 200 and searched for from system 100, or if the electronic document were created on system 100 and searched for from said system 100, etc.).

[0033] Thus, by appending information, such as address information, application information, and access information, etc., as necessary to the output

document in a format that can be read by a computer, according to this example embodiment, it becomes possible to find and load the original electronic document from a network without having to go through a third party.

[0034] In addition, since address information is appended as appended information, it becomes possible to directly and automatically load the electronic document from the output document without having to search the computer based on the memory of the creator, etc., and without some complicated operation checking the contents of the electronic document that has been found.

[0035] Furthermore, since access authorization information is appended as appended information, the creator of said electronic document can control access authorization for editing, copying, and displaying its contents, making it possible to improve protection of the electronic document.

[0036] In addition, since application information is appended as appended information, the application for editing, etc. the electronic document that has been found and loaded can be automatically started, making it possible to simplify the operation for editing, etc. the electronic document.

[0037] Moreover, the information appended to the output document in this example embodiment was a bar code, as shown in Figure 3, but it is not limited to this and may as well be a two-dimensionally arrayed code, an encryption, or a magnetic code. The appended information may also be added with invisible toner or ink. In addition, the device for appending the appended information is not limited to the device shown in Figure 3. Namely, as long as it appends information on the output document in a format that can be easily read by the reading part, the encoding method and recording method are not limited.

[0038] In addition, in the above example embodiment, output processing was executed on computer 5 and input processing was executed on computer 10, but there is no reason that it is limited to this. For instance, it could easily be inferred that a constitution would also be acceptable in which high-performance peripheral devices are used so that

5

output processing is performed by an output and input processing is performed by a reading part

[0039] Additionally, address information, application information, and access authorization information were appended in this example embodiment as appended information of the electronic document, but the appended information is not limited only to this information, and other information, e.g., information needed to search for the electronic document, such as the author and creation date of the electronic document, etc.. could also be appended, as required.

[0040] Furthermore, in cases in which a multiple-page electronic document has been created, by distributing the output document noting or displaying only the number of pages in, or noting only a summary of, the electronic document as appended information, it becomes possible for only those people who need all or part thereof to search for and order the electronic document. This makes it possible to reduce the amount of paper distributed.

[0041]

[Effect] Since, according to the electronic document search system of claim 1, information pertaining to an electronic document is appended to an output document in which said electronic document is output on paper, the information appended to the output document can be read, and a search of said electronic document can be performed on the basis of that information, as described above, it becomes possible to search for the original electronic document from an output document that has been distributed, without going through a third party, which yields the effect of making the operation for obtaining the original document easier.

[0042] In addition, since, according to the electronic document search system of claim 2, information pertaining to an electronic document is appended to an output document in a format that is easily read by an appended information reading means, it yields the effects of being able to simply the constitution of the appended information reading means, and of being able to perform the appended information reading operation at high speed.

[0043] Additionally, since, according to the electronic document search system of claim 3,

address information is appended as appended information, it becomes possible to directly and automatically load the electronic document from the output document without having to search the computer based on the memory of the creator, etc., and without some complicated operation checking the contents of the electronic document that has been found, which, as a result, yields the effect of simplifying operation.

[0044] Furthermore, since access authorization information is appended as appended information according to the electronic document search system of claim 4, the creator of said electronic document can restrict access authorization for editing, copying, and displaying its contents, yielding the effect of making it possible to improve protection of the electronic document.

[0045] In addition, since application information is appended as appended information according to the electronic document search system of claim 5, the application for editing, etc. the electronic document that has been found and loaded can be automatically started, yielding the effect of making it possible to simplify the operation for editing, etc. the electronic document.

[0046] Additionally, since an output document that contains only a summary of the contents of the electronic document is distributed according to the electronic document search system of claim 6, and only those persons who need to can search for an order the electronic document, it yields the effects of reducing the amount of paper distributed and of shortening the time spent searching, i.e., checking contents, etc.

[0047] Furthermore, when a person needs an original electronic document, since, according to the electronic document search system of claim 7, the person requesting a document can read the desired original electronic document via the network, without going through the creator, etc. of said electronic document, the effect of further simplifying the operation for acquiring an original electronic document is yielded.

[Brief Description of the Figures]

[Figure 1] This is a block diagram showing the constitution of the electronic document search

6

system associated with an example embodiment of this invention.

[Figure 2] This is a flowchart to explain the processing and operation to create and record appended information that is executed by this system.

[Figure 3] This is a drawing showing an example of an output document and of the format of the appended information appended to said output document.

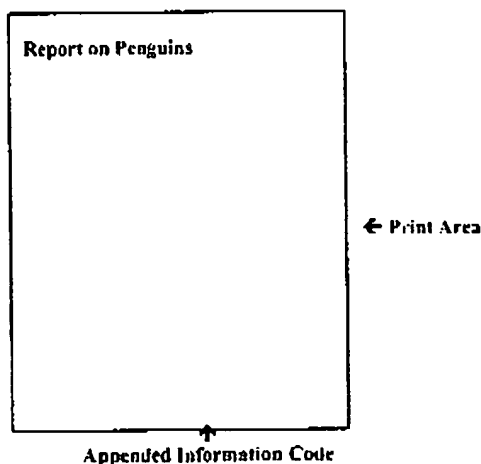[Figure 4] This is a flow chart showing the processing for searching for an original electronic document.

[Legend]

3   reading part (appended information reading means)

4   output part (information appending means)

5   computer (search processing means, appended information reading means)

8   reading part (appended information reading means)

9   output part (information appending means)

10 computer (search processing means, appended information reading means)

[Fig. 1]

- Legend -
(Using the callout numbers in the figure)

1	Display Part
2	Storage Part
3	Reading Part
4	Output Part
5	Computer
6	Display Part
7	Storage Part
8	Reading Part
9	Output Part
10	Computer

[Fig. 2]

- Legend -
(Using the step numbers in the original flow chart)

(START)
S21 Create electronic document
S22 Store electronic document
S23 Write appended information?
S24 Append application information?
S25 Create application information
S26 Append access authorization information?
S27 Create access authorization information
S28 Create appended information
S29 Write appended information
S30 Output document
(END)

[Fig. 3]
Example of Output Document
with Appended Information

Report on Penguins

← Print Area

↑
Appended Information Code

[Fig. 4]

- Legend -
(Using the step numbers in the original flow chart)

(START)
S41 Input appended information
S42 Analyze appended information
S43 Is appended information proper?
S44 Execute search
S45 Has target document been found?
S46 Is there access authorization information?
S47 Grant access authorization
S48 Is there application information?
S49 Start application
S50 Load electronic document
S51 Display on screen
S52 Display warning text
(END)

7